

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-639-8

CODE: (SP)

DATE: 10/28/2014

SUBJECT: Traffic Signal and ITS Equipment Poles

Section 639, Traffic Signal Equipment Poles, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby deleted and replaced as follows.

SECTION 907-639 - TRAFFIC SIGNAL AND ITS EQUIPMENT POLES

907-639.01--Description. This work consists of furnishing all component materials required to form completed independent signal equipment poles and extensions of the types specified and assembling, constructing, erecting and installing same in conformity with these specifications to ensure support poles in accordance with the design(s) and at the lines and grades shown on the plans or as directed.

This work also consists of furnishing and installing support poles and foundations for Intelligent Transportation Systems (ITS) equipment. This work shall consist of assembling, constructing, erecting and installing ground mounted equipment poles with foundations, and equipment poles attached to existing or proposed structures, in conformity with these specifications and in accordance with the design(s) shown on the plans or as directed.

907-639.02--Materials. The materials used in this construction shall conform with the general requirements of these specifications and the specific requirements set out herein.

907-639.02.1--Poles.

907-639.02.1.1--Traffic Signal Poles. Traffic signal poles shall meet the requirements of Subsection 722.02. The traffic signal equipment pole shaft extension shall meet the requirements of the plan.

907-639.02.1.2--Galvanized Steel Poles for Cameras. Ground mounted camera poles and foundations, conduits, connections, clamps, anchor bolts, shoe bases and all other members shall be designed and fabricated in accordance with the standards and requirements listed below. Design and materials documentation shall be furnished as part of the approval request submittal. Certifications will be furnished upon request by the Engineer.

- 1) Poles shall be designed in accordance with the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals", current edition, including all interims and updates. Design life shall be 50 years for all poles. The design wind speed for all parts of the structure shall be as shown in the design specifications with a minimum of 90 mph. For projects that are in areas with higher wind standards, the higher standard shall be used. The pole shall meet design wind loading with camera(s) installed.

- 2) The Contractor shall submit manufacturer's shop drawings, layout drawings and specifications for equipment and appurtenances for approval by the Engineer no later than ninety (90) days after notice to proceed.
- 3) Pole fabricator shall be certified under Category I, "Conventional Steel Structures" as set forth by the American Institute of Steel Construction Quality Certification Program. Proof of this certification will be required.
- 4) All welding shall be in accordance with Sections 1 through 8 of the American Welding Society (AWS) D1. 1 Structural Welding Code. Tackers and welders shall be qualified in accordance with the American Welding Society Structural Welding code. Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with automatic processes, and be visually inspected. Longitudinal welds suspected to contain defects shall be magnetic particle inspected. All circumferential butt welded pole and arm splices shall be ultrasonically and radio graphically inspected. All inspection records will be furnished to the Engineer.
- 5) Camera pole system shall consist of a pole, anchor bolts, base plate, ground rod array, communication and power conduits to nearest pull box, grounding conduit, spare conduit and foundation.
- 6) Design computations for the camera poles shall be complete and shall include but not be limited to the following:
 - Consideration shall be given for all parts of the structure.
 - Consideration shall be given for all possible loading combinations including wind and ice loads.
 - Computations shall include design stresses and allowable stresses for all components which comprise the proposed structure.
 - Top of pole deflection shall not exceed 1-inch deflection from center due to 30 mph (non-gust) winds for the 50-foot poles.
 - All complete shop drawings and design computations shall bear the stamp of a Professional Engineer registered in the State of Mississippi.
 - Shop drawings shall be approved by the Engineer prior to fabrication. Approval of the shop drawings does not relieve the Contractor of responsibility for the design, fabrication and erection of the structure.
 - The Engineer reserves the right to reject a pole design if the calculated deflection exceeds that specified herein.
 - The foundation design shall be based on actual soil conditions from soil borings conducted by the Contractor. The cost of the soil borings shall be included in the cost of the pole.
 - The calculations shall include a pole, base plate, and anchor bolt analysis. The pole calculations shall be analyzed at the pole base, 5-foot pole intervals, and at each slip joint splice.
- 7) For each pole shown in the Plans, the following information shall be given:
 - Top/bottom diameter, taper rate, wall thickness, section modulus, moment of inertia, and cross sectional area for each pole section.
 - The centroid, weight, projected area, drag coefficient, velocity pressure, and wind force of each trapezoidal pole section.

- The axial force, shear force, primary moment, total moment, axial stress, bending stress, allowable axial stress, allowable bending stress, allowable shear stress and combined stress ratio (CSR) at each pole section.
 - The pole's angular and linear deflection at each section.
- 8) Pole Mounted Cabinet Access Conduit Nipple:
- Each pole will be manufactured with a 2-inch diameter rigid threaded nipple for conduit connection to a pole-mounted cabinet.
 - The height of this nipple above the base of the pole shall be such that a cabinet mounting height of three (3) feet above ground can be provided.
- 9) Hand Holes:
- Hand hole openings shall be reinforced with 2-inch wide hot rolled steel bar. The opening shall be rectangular and 5" x 8" nominal.
 - The cover shall be 11-gauge steel and shall be secured to a clip-on lock with a tamper-proof screw.
 - The reinforcing rim shall be provided with a 1/2-inch tapped hole and 1/2-inch hex head cap screw for grounding.
 - Hand holes on poles with pole-mounted cabinets and transformers shall be placed toward oncoming traffic. For all other poles, hand holes shall face away from traffic.
 - Section at hand hole to be reinforced to have equivalent section modulus as the section without the hand hole.
- 10) Cable Supports (J-Hooks & Eyelets): Top and bottom J-hooks and eyelets shall be located within the pole directly aligned with each other.
- 11) Base Plate:
- Base plates shall conform to ASTM A572 (50 ksi min. yield).
 - Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration butt weld with backup bar.
 - Plates shall be hot dip galvanized.
- 12) Anchor Bolts:
- Anchor bolts shall conform to the requirements of AASHTO M314-90 (105 ksi min. yield.) The upper 12 inches of the bolts shall be hot dip galvanized per ASTM A153.
 - Each anchor bolt shall be supplied with two (2) hex nuts and two (2) hardened washers.
 - The strength of the nuts shall equal or exceed the proof load of the bolts.
 - The top nut shall be torqued so as to produce 60% yield stress of anchor bolt.
 - The Contractor shall not grout between bottom of base plate and top of concrete foundation.
- 13) Pole heights shall be as indicated on the plans.

907-639.02.1.3--Galvanized Steel Poles for Detectors. Ground mounted detector poles and foundations, conduits, connections, clamps, anchor bolts, shoe bases and all other members shall be designed and fabricated in accordance with the standards and requirements listed below. Design and materials documentation shall be furnished as part of the approval request submittal. Certifications will be furnished upon request by the Engineer.

- 1) Poles shall be designed in accordance with the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals", current edition,

including all interims and updates. Design life shall be 50 years for all poles. Poles shall be designed to withstand the specified forces including those produced by a 100 mph wind with a 1.14 gust effect factor.

- 2) The Contractor shall submit manufacturer's shop drawings, layout drawings and specifications for equipment and appurtenances for approval by the Engineer no later than ninety (90) days after notice to proceed.
- 3) Pole fabricator shall be certified under Category I, "Conventional Steel Structures" as set forth by the American Institute of Steel Construction Quality Certification Program. Proof of this certification will be required.
- 4) Poles shall be formed from a single sheet of hot rolled weldable grade steel, galvanized in accordance with ASTM Designation: A 123. Unless otherwise noted on the plans, poles shall be made from steel meeting the requirements of ASTM Designation: A 572 Grade 55, or A 595 Grade A. Minimum yield strength shall be 48,000 psi after fabrication. Design wind loading shall be as indicated on the plans. The pole shall meet design wind loading with detector(s) installed.
- 5) Poles shall have a constant taper of 0.14 inch nominal per foot.
- 6) All poles shall be equipped with a breakaway device which conforms to the latest AASHTO and FHWA requirements, which have been approved by same. The Contractor shall submit a manufacturer's certification with the pole shop plans stating that the device meets, or exceeds, these standards.
- 7) Pole heights shall be as indicated on the plans.
- 8) Detector pole system shall consist of, but not be limited to a pole, anchor bolts, breakaway base, base plate, ground rod array, communication and power conduit to nearest pull box, grounding conduit, spare conduit and foundation as shown on the Plans.
- 9) Anchor bolts, washers and hex nuts shall be made of steel in accordance with ASTM Designation: F 1554, Grade 55, and shall be galvanized as per ASTM Designation: A 153. Anchor bolts shall be provided for each pole with two (2) hex nuts and washers per bolt. Anchor bolts shall be "L" shaped; minimum yield strength shall be 50,000 psi. A bolt layout template shall be provided by the manufacturer for proper bolt installation. The number of anchor bolts and design yield strength shall be as recommended by the manufacturer.

907-639.02.1.4--Aluminum Poles for Detectors. Ground mounted detector poles and foundations, conduits, connections, clamps, anchor bolts, breakaway bases and all other members shall be designed and fabricated in accordance with the standards and requirements listed below. Design and materials documentation shall be furnished as part of the approval request submittal. Certifications will be furnished upon request by the Engineer.

- 1) Poles shall be designed in accordance with the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals", current edition, including all interims and updates. Design life shall be 50 years for all poles. The design wind speed for all parts of the structure shall be as shown in the design specifications with a minimum of 90 mph. The pole shall meet design wind loading with detector(s) installed.
- 2) The Contractor shall submit manufacturer's shop drawings, layout drawings and specifications for equipment and appurtenances for approval by the Engineer no later than ninety (90) days after notice to proceed.

- 3) Poles shall be spun or formed from aluminum seamless tubing meeting requirements of ASTM Designation: B 210, Alloy 6063-T4 and after fabrication shall have mechanical properties not less than those specified for Alloy 6063-T6. The poles may also be formed from aluminum plates or sheets meeting the requirements of ASTM Designation: B 209, Alloys 5052-H34 or 5086-H34.
- 4) External surface of poles shall have a satin-type finish, clean and smooth, with all details defined and true to pattern.
- 5) Poles shall have a constant taper of 0.14 inch nominal per foot.
- 6) All poles shall be equipped with a breakaway device which conforms to the latest AASHTO and FHWA requirements, which have been approved by same. The Contractor shall submit a manufacturer's certification with the pole shop plans stating that the device meets, or exceeds, these standards.
- 7) Pole heights shall be as indicated on the plans.
- 8) Detector pole system shall consist of, but not be limited to a pole, anchor bolts, breakaway base, base plate, ground rod array, communication and power conduit to nearest pull box, grounding conduit, spare conduit and foundation as shown on the Plans.
- 9) Anchor bolts, washers and hex nuts shall be made of steel in accordance with ASTM Designation: F 1554, Grade 55, and shall be galvanized as per ASTM Designation: A 153. Anchor bolts shall be provided for each pole with two (2) hex nuts and washers per bolt. Anchor bolts shall be "L" shaped; minimum yield strength shall be 50,000 psi. A bolt layout template shall be provided by the manufacturer for proper bolt installation. The number of anchor bolts and design yield strength shall be as recommended by the manufacturer.

907-639.02.1.5--Structure-Mounted ITS Equipment Poles. Structure-mounted equipment poles and conduits, connections, clamps, mounting hardware and all other members shall be designed and fabricated in accordance with the standards and requirements listed below. Design and materials documentation shall be furnished as part of the approval request submittal. Certifications will be furnished upon request by the Engineer.

- 1) Poles shall be designed in accordance with the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals", current edition, including all interims and updates. Design life shall be 50 years for all poles. The design wind speed for all parts of the structure shall be as shown in the design specifications with a minimum of 90 mph. For projects that are in areas with higher wind standards, the higher standard is required. The pole shall meet design wind loading with all equipment installed.
- 2) The Contractor shall submit manufacturer's shop drawings, layout drawings and specifications for equipment and appurtenances for approval by the Engineer no later than ninety (90) days after notice to proceed.
- 3) Pole fabricator shall be certified under Category I, "Conventional Steel Structures" as set forth by the American Institute of Steel Construction Quality Certification Program. Proof of this certification will be required.
- 4) All welding shall be in accordance with Sections 1 through 8 of the American Welding Society (AWS) D1. 1 Structural Welding Code. Tackers and welders shall be qualified in accordance with the American Welding Society Structural Welding code. Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with

automatic processes, and be visually inspected. Longitudinal welds suspected to contain defects shall be magnetic particle inspected. All circumferential butt welded pole and arm splices shall be ultrasonically and radio graphically inspected. All inspection records will be furnished to the Engineer.

- 5) ITS equipment pole system shall consist of a pole, connectors, clamps, mounting hardware, ground wires and rods, grounding conduit, and communication and power conduits to nearest pull box.
- 6) Design computations for structure-mounted poles shall be complete and shall include but not be limited to the following:
 - Consideration shall be given for all parts of the structure.
 - Consideration shall be given for all possible loading combinations including wind and ice loads.
 - Computations shall include design stresses and allowable stresses for all components which comprise the proposed structure.
 - Top of pole deflection shall not exceed 1-inch deflection from center (2-inch deflection diameter) due to 30 mph (non-gust) winds.
 - All complete shop drawings and design computations shall bear the stamp of a Professional Engineer registered in the State of Mississippi.
 - Shop drawings shall be approved by the Engineer prior to fabrication. Approval of the shop drawings does not relieve the Contractor of responsibility for the design, fabrication and erection of the structure.
 - The Engineer reserves the right to reject a pole design if the calculated deflection exceeds that specified herein.
 - The calculations shall include a pole, base plate, and anchor bolt analysis. The pole calculations shall be analyzed at the pole base, 5-foot pole intervals, and at each slip joint splice.
- 7) For each pole shown in the Plans, the following information shall be given:
 - Top/bottom diameter, taper rate, wall thickness, section modulus, moment of inertia, and cross sectional area for each pole section.
 - The centroid, weight, projected area, drag coefficient, velocity pressure, and wind force of each trapezoidal pole section.
 - The axial force, shear force, primary moment, total moment, axial stress, bending stress, allowable axial stress, allowable bending stress, allowable shear stress and combined stress ratio (CSR) at each pole section.
 - The pole's angular and linear deflection at each section.
- 8) Hand Holes:
 - Hand hole openings shall be reinforced with 2-inch wide hot rolled steel bar. The opening shall be rectangular and 5" x 8" nominal.
 - The cover shall be 11-gauge steel and shall be secured to a clip-on lock with a tamper-proof screw.
 - The reinforcing rim shall be provided with a 1/2-inch tapped hole and 1/2-inch hex head cap screw for grounding.
 - Section at hand hole to be reinforced to have equivalent section modulus as the section without the hand hole.

- 9) Cable Supports (J-Hooks & Eyelets): Top and bottom J-hooks and eyelets shall be located within the pole directly aligned with each other.
- 10) Pole heights shall be as indicated on the plans.

907-639.02.2--Traffic Signal Mast Arms. Traffic signal mast arms and mast arm extensions shall be steel meeting the requirements of Subsection 722.16.

907-639.02.3--Foundations.

907-639.02.3.1--Foundations for Traffic Signal Poles. Cast-in-place foundations for concrete, steel, and/or aluminum shafts shall be as specified on plans, and shall be cast of reinforced Class "B" Concrete conforming to the requirements of Sections 601 and 602. Anchor bolts, washers, and hexagon bolts for use in the foundation shall conform to Subsections 722.11 and 722.12. The anchor bolt shall be galvanized only through the threaded section and a minimum of six inches below the top of the concrete foundation. The foundation bolts shall be set in the concrete foundation to fit the bolt circle of each type of pole. Conduit for electric cable shall comply with the requirements for such materials as set out in Subsection 722.05.

907-639.02.3.2--Foundations for ITS Poles. Cast-in-place foundations for ground mounted equipment poles shall be Contractor Designed in accordance with this specification and the plans. It shall be cast with reinforced Class "B" Concrete conforming to the requirements of Sections 601 and 602. Anchor bolts, washers and hex nuts for use in the foundation shall conform to requirements set forth in these specifications. Conduit for electric cable and fiber optic cable shall comply with the requirements for such materials as set out in Subsection 722.05.

907-639.03--Construction Requirements.

907-639.03.1--Installation of ITS Equipment. All equipment shall be installed according to the manufacturer's recommendations. Materials and associated accessories/adapters shall not be applied contrary to the manufacturer's recommendations and standard practices. ITS equipment pole systems shall be installed as indicated on the Plans and shall conform to the following requirements:

- 1) All poles shall be installed in accordance with the National Electric Safety Code and the latest AASHTO standards.
- 2) Foundations for ground mounted poles:
 - The Contractor shall submit a design for each pole foundation that has been sealed by a Professional Engineer registered in the State of Mississippi.
 - Excavation for concrete foundations shall be opened vertically in accordance with the methods of Section 206 with a tolerance of plus two inches from neat lines and grades as shown on the Plans or required by local conditions. Adjacent earth shall be compacted sufficiently to withstand the loadings set out in Subsections 907-639.02.1 and 907-639.02.2.

- If soil conditions require the use of any shoring, casings, or sonotube for proper installation of the foundations, the cost of the shoring, casings or sonotube shall be included in the cost of the pole and foundation.
- Before placing concrete, the Contractor shall place reinforcing bars, conduit and anchor bolts, all in accordance with plan details, and held rigidly in place by approved methods.
- Concrete foundations shall be formed, cast and cured in accordance with the provisions of Section 601. The top surface shall be finished smooth, and sloped to drain.
- Concrete shall cure a minimum of seven (7) days before any load is applied to the foundation.
- Conduit shall be installed in the pole foundation for access and includes conduit to the nearest pull box as shown in the Plans.
- A minimum of one 2-inch spare conduit shall be installed in all pole foundations as shown in the Plans. Spare conduits in pole foundations shall be sealed with blank duct plugs.

3) Grounding System:

- The Contractor shall supply and install a grounding system with ground rod array at the base of all poles as shown on the Plans.
- The ground rod array system shall be connected to the pole through an appropriate ground clamp.
- A #6 AWG copper stranded bonding wire shall be installed between the pole and the field cabinet providing a common ground system for each site.
- All ground bonding wires shall be un-spliced.

4) The installation method for the CCTV poles and cameras shall be such that the camera can be rotated as needed around the pole for optimum placement.

907-639.03.2--Foundations. In some instances, it may be necessary to use slip casing to keep the foundation holes open. Casing may be required in portions of the holes that are not stable. Casings authorized by the Engineer shall be of suitable size and strength to accommodate the drilling equipment and to withstand ground-pressures and removal operations without deformation of the poured shaft. When removed, the casings shall revert to the Contractor for disposal.

Due to the soil conditions in certain areas, the plans may indicate locations where the concrete shall be placed with a tremie. When a tremie is used, it shall perform in accordance with the requirements in Subsection 907-804.03.9 of the Standard Specifications.

907-639.03.2.1--Foundations for Traffic Signal Poles. Excavation for concrete foundations or butts shall be opened vertically in accordance with the methods of Section 801 with a tolerance of plus two inches from neat lines and grades as shown on the plans or required by local conditions. Adjacent earth shall be compacted sufficiently to withstand the loadings set out under Subsection 722.02.1.3. Before placing concrete, the Contractor shall place reinforcing bars, conduit and anchor bolts, all in accordance with plan details, and held rigidly in place by approved methods. Concrete foundations shall be formed, cast and cured in accordance with the provisions of Section 601. The top surface shall be finished smooth, and sloped to drain.

907-639.03.2.2--Foundations for Ground Mounted ITS Poles. Pole foundations shall be constructed as per the details on the plans, these specifications, and Section 803 of the Standard Specifications. Casings, if required, will be in accordance with Section 803 of the Standard Specifications.

907-639.03.3--Setting and Aligning Traffic Signal Poles. Traffic signal poles anchored to the concrete foundation or with precast butts shall have sufficient rake so as to assume a vertical position when the load is applied. Poles with precast butt shall be wet-tamped in place with crushed aggregate, concrete or satisfactory cement stabilized soil, as directed. Poles set on concrete foundations may use leveling nuts to align poles. After alignment of pole on the concrete foundation is completed, the entire area between the bottom of the pole and the top of the concrete foundation shall be filled with grout meeting the requirements of Subsection 714.11. Careful aligning of the poles shall be considered a most essential feature of the installation of the assembly and shall be as nearly perfect as practicable.

907-639.04--Method of Measurement. Traffic signal equipment pole of the type specified will be measured as a unit quantity per each, which measurement shall include the pole, mast arms and all other incidentals necessary to complete the equipment pole.

Traffic signal equipment pole shaft extension of the type specified will be measured as a unit quantity per each, which measurements shall include the pole attachment, shaft, and all other mounting attachments necessary to extend a shaft as required in the plans.

Traffic signal equipment pole mast arm extension, as indicated, will be measured as a unit quantity per each, which measurements shall include the mast arm extension and all other mounting attachments necessary to extend the arm as indicated.

Traffic signal pole foundations of the size specified will be measured by the cubic yard, which measurement shall be the area bounded by the vertical planes of the neat lines of the foundation.

Camera pole with foundation and detector pole with foundation will be measured as a unit quantity per each. No separate payment will be made for camera and detector pole foundations. Measurement for progress payments for camera and detector poles may be made as follows.

- 1) 25% of the contract unit price upon complete installation of foundations;
- 2) Additional 45% of the contract unit price upon delivery of poles or structure to the site; and
- 3) Final 30% of the contract unit price upon complete installation of pole system

Structure-mounted equipment pole will be measured as a unit quantity per each. Measurement for progress payments for Structure-mounted equipment pole may be made as follows.

- 1) 70% of the contract unit price upon delivery of poles or structure to the site; and
- 2) Final 30% of the contract unit price upon complete installation of pole system

Slip casings of the size specified will be measured by the linear foot from the ground elevation to the bottom of the strata needing to be cased.

907-639.05--Basis of Payment. Traffic signal equipment pole and traffic signal equipment pole extension of the type specified, measured as provided in above, will be paid for at the contract unit price per each, which price shall be full compensation for furnishing all materials, erecting, installing, connecting and testing poles, pole bases, mast arms, caps, covers, ground wire, ground rods, hardware and for all equipment, tools, labor and incidentals necessary to complete the equipment pole.

Traffic signal equipment pole mast arm extension, measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for furnishing all materials, for installing the mast arm extension and for all equipment, tools, labor, and incidentals necessary to complete the work.

Traffic signal pole foundations, measured as prescribed above, will be paid for at the contract unit price per cubic yard, which price shall include full compensation for structure excavation, reinforcing steel, anchor bolts; for placing, curing, and installing concrete; for replacing sod and final clean-up; and for all equipment, labor, tools and incidentals necessary to complete the foundation.

Camera pole with foundation and detector pole with foundation, measured as prescribed above, will be paid for at the contract unit price per each, which price shall be full compensation for furnishing all materials, for excavating, backfilling, replacing sod, and for all constructing, placing, curing, erecting, installing, connecting and testing; for foundations, poles, pole bases, conduit inside foundation and to nearest pull box as indicated on the Plans, wiring between camera and field cabinet, connections to support structures, caps, covers, ground wire, ground rods, hardware and for all equipment, tools, labor and incidentals necessary to complete the work, including remote and local control of the camera site complete in place and ready for use.

Structure-mounted equipment pole, measured as prescribed above, will be paid for at the contract unit price per each, which price shall be full compensation for furnishing all materials, for all constructing, placing, erecting, installing, connecting and testing, for poles, conduit between structure attachment location and nearest pull box as indicated on the Plans; wiring between pole-mounted devices and field cabinet; all structure-mounting hardware indicated on the Plans, caps, covers, ground wire, ground rods, hardware and for all equipment, tools, labor and incidentals necessary to complete the work, including remote and local control of the camera site complete in place and ready for use.

No separate payment will be made for camera and detector pole foundations.

Slip casings, measured as prescribed above, will be paid for at the contract price per linear foot, which price shall be full compensation for all materials, tools, equipment, labor, and incidentals necessary to complete to work.

Payment will be made under:

- | | |
|---------------------------------------------------------------|-------------------|
| 907-639-A: Traffic Signal Equipment Pole, Type ____ | - per each |
| 907-639-B: Traffic Signal Equipment Pole Shaft Extension * | - per each |
| 907-639-C: Pole Foundations, ____ Diameter | - per cubic yard |
| 907-639-D: Slip Casing, ____ Diameter | - per linear foot |
| 907-639-E: Camera Pole with Foundation, ____' Pole | - per each |
| 907-639-F: Detector Pole with Foundation, ____' Pole | - per each |
| 907-639-G: Traffic Signal Equipment Pole Mast Arm Extension * | - per each |
| 907-639-H: ITS Equipment Pole, Structure Mounted, ____' Pole | - per each |

* Additional information may be indicated